

We claim:

1. A method of inhibiting corrosion comprising the step of:  
providing a corrosive environment; and,  
adding a corrosion inhibitor comprising a reaction product of a thiol compound and an aldehyde compound.
2. The method of claim 1 wherein the corrosive environment is an acidic environment.
3. The method of claim 1 wherein the corrosive environment is a heavy brine environment.
4. The method of claim 1 wherein the reaction product of a thiol compound and an aldehyde compound comprises a thioacetal.
5. The method of claim 4 wherein the thioacetal comprises monothioacetal, a dithioacetal, or a combination thereof.
6. The method of claim 1 wherein the aldehyde compound comprises a cinnamaldehyde, a cinnamaldehyde derivative, a crotonaldehyde, a crotonaldehyde derivative, a benzene acetaldehyde, a benzene acetaldehyde derivative, or a combination thereof.
7. The method of claim 1 wherein the thiol compound comprises thiosorbitol, hydrogen sulfide, methanethiol, thioethanol, 1-thio-2-butanol, 1,2-ethanedithiol, 1,3-propanedithiol, 2-aminoethanethiol, 2-mercaptobenzothiazole, 2-mercaptothiazoline, glycol dimercaptoacetate, mercaptosuccinic acid, thioglycerol, thiolactic acid, cysteine, 6-amino-3-mercaptothiazole, 6-ethoxy-2-mercaptobenzothiazole, glycerol monothioglycolate, monoethanolamine thioglycolate, methyl thioglycolate, isooctyl thioglycolate, ethyl thioglycolate, 2-ethyl hexyl thioglycolate, thioglycolic acid, or a combination thereof.
8. The method of claim 1 wherein the corrosion inhibitor further comprises a traditional corrosion inhibitor.
9. The method of claim 8 wherein the traditional corrosion inhibitor comprises cinnamaldehyde, acetylenic alcohols, fluorinated surfactants, quaternary derivatives of heterocyclic nitrogen bases, quaternary derivatives of halomethylated aromatic compounds, formamides, quaternary ammonium compounds, or combinations thereof.

10. The method of claim 8 wherein the traditional corrosion inhibitor comprises N-alkyl, N-cycloalkyl, an N-alkylarylpyridinium halide, N-alkyl, N-cycloalkyl, a N-alkylarylquinolinium halide, or a combination thereof.

11. The method of claim 8 wherein the traditional corrosion inhibitor is present in an amount ranging from about 0.5% to about 80% by weight of the total corrosion inhibitor.

12. The method of claim 8 wherein the traditional corrosion inhibitor is present in an amount ranging from about 1% to about 45% by weight of the total corrosion inhibitor.

13. The method of claim 8 wherein the corrosion inhibitor further comprises a corrosion inhibitor activator.

14. The method of claim 13 wherein the corrosion inhibitor activator comprises cuprous iodide; cuprous chloride; an antimony oxide, an antimony halide, an antimony tartrate, an antimony citrate, an alkali metal salt of antimony tartrate, an alkali metal salt of antimony citrate, an alkali metal salt of pyroantimonate, an antimony adduct of ethylene glycol; a bismuth oxide, a bismuth halide, a bismuth tartrate, a bismuth citrate, an alkali metal salt of bismuth tartrate, an alkali metal salt of bismuth citrate, iodine, an iodide compound, formic acid, and combinations thereof.

15. The method of claim 13 wherein the corrosion inhibitor activator is present in an amount ranging from about 0.1% to about 100% by weight of the total corrosion inhibitor.

16. The method of claim 1 wherein the corrosion inhibitor further comprises a surfactant.

17. The method of claim 16 wherein the surfactant comprises an ethoxylated nonyl phenol phosphate ester, a non-ionic surfactant, a cationic surfactant, a non-ionic surfactant, an alkyl phosphonate surfactant, a linear alcohol, a monophenol compound, an alkoxyated fatty acid, an alkylphenol alkoxyate, an ethoxylated amide, an ethoxylated alkyl amine, or a combination thereof.

18. The method of claim 16 wherein the surfactant is present in an amount ranging from about 0.1% to about 50% of the weight of the total corrosion inhibitor.

19. The method of claim 1 wherein the corrosion inhibitor further comprises a solvent.

20. The method of claim 19 wherein the solvent comprises an alcohol, a glycol, dimethyl formamide, N-methyl pyrrolidone, water or a combination thereof.

21. The method of claim 19 wherein the solvent is present in an amount ranging from about 0.1% to about 60% by weight of the total corrosion inhibitor.

22. A method of acidizing a near well bore region of a subterranean formation comprising the steps of:

- (a) isolating a zone of interest along a well bore; and,
- (b) placing an acidizing solution the zone of interest wherein the acidizing solution comprises an acid and a corrosion inhibiting compound comprising the reaction product of a thiol compound and an aldehyde compound.

23. The method of claim 22 wherein the reaction product of a thiol compound and an aldehyde compound comprises a thioacetal.

24. The method of claim 23 wherein the thioacetal comprises monothioacetal, a dithioacetal, or a combination thereof.

25. The method of claim 22 wherein the aldehyde compound comprises a cinnamaldehyde, a cinnamaldehyde derivative, a crotonaldehyde, a crotonaldehyde derivative, a benzene acetaldehyde, a benzene acetaldehyde derivative, or a combination thereof.

26. The method of claim 22 wherein the thiol compound comprises thiosorbitol, hydrogen sulfide, methanethiol, thioethanol, 1-thio-2-butanol, 1,2-ethanedithiol, 1,3-propanedithiol, 2-aminoethanethiol, 2-mercaptobenzothiazole, 2-mercaptothiazoline, glycol dimercaptoacetate, mercaptosuccinic acid, thioglycerol, thiolactic acid, cysteine, 6-amino-3-mercaptothiazole, 6-ethoxy-2-mercaptobenzothiazole, glycerol monothioglycolate, monoethanolamine thioglycolate, methyl thioglycolate, isooctyl thioglycolate, ethyl thioglycolate, 2-ethyl hexyl thioglycolate, thioglycolic acid, or a combination thereof.

27. The method of claim 22 wherein the corrosion inhibitor further comprises a traditional corrosion inhibitor.

28. The method of claim 27 wherein the traditional corrosion inhibitor comprises cinnamaldehyde, acetylenic alcohols, fluorinated surfactants, quaternary derivatives of heterocyclic nitrogen bases, quaternary derivatives of halomethylated aromatic compounds, formamides, quaternary ammonium compounds, or combinations thereof.

29. The method of claim 27 wherein the traditional corrosion inhibitor comprises N-alkyl, N-cycloalkyl, an N-alkylarylpyridinium halide, N-alkyl, N-cycloalkyl, a N-alkylarylquinolinium halide, or a combination thereof.

30. The method of claim 27 wherein the traditional corrosion inhibitor is present in an amount ranging from about 0.5% to about 80% by weight of the total corrosion inhibitor.

31. The method of claim 27 wherein the traditional corrosion inhibitor is present in an amount ranging from about 1% to about 45% by weight of the total corrosion inhibitor.

32. The method of claim 27 wherein the corrosion inhibitor further comprises a corrosion inhibitor activator.

33. The method of claim 32 wherein the corrosion inhibitor activator comprises cuprous iodide; cuprous chloride; an antimony oxide, an antimony halide, an antimony tartrate, an antimony citrate, an alkali metal salt of antimony tartrate, an alkali metal salt of antimony citrate, an alkali metal salt of pyroantimonate, an antimony adduct of ethylene glycol; a bismuth oxide, a bismuth halide, a bismuth tartrate, a bismuth citrate, an alkali metal salt of bismuth tartrate, an alkali metal salt of bismuth citrate, iodine, an iodide compounds, formic acid, and combinations thereof.

34. The method of claim 32 wherein the corrosion inhibitor activator is present in an amount ranging from about 0.1% to about 100% by weight of the total corrosion inhibitor.

35. The method of claim 22 wherein the corrosion inhibitor further comprises a surfactant.

36. The method of claim 35 wherein the surfactant comprises an ethoxylated nonyl phenol phosphate ester, a non-ionic surfactant, a cationic surfactant, a non-ionic surfactant, an alkyl phosphonate surfactant, a linear alcohol, a monophenol compound, an alkyoxylated fatty acid, an alkylphenol alkoxyate, an ethoxylated amide, an ethoxylated alkyl amine, or a combination thereof.

37. The method of claim 35 wherein the surfactant is present in an amount ranging from about 0.1% to about 50% of the weight of the total corrosion inhibitor.

38. The method of claim 22 wherein the corrosion inhibitor further comprises a solvent.

39. The method of claim 38 wherein the solvent comprises an alcohol, a glycol, dimethyl formamide, N-methyl pyrrolidone, water or a combination thereof.

40. The method of claim 38 wherein the solvent is present in an amount ranging from about 0.1% to about 60% by weight of the total corrosion inhibitor.

41. The method of claim 22 wherein the acid comprises hydrochloric acid, hydrofluoric acid, acetic acid, formic acid, citric acid, ethylene diamine tetra acetic acid ("EDTA"), or a combination thereof.